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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/550,953	09/28/2005	Youichi Arai	050641	4005
23850 7590 01/10/2007 ARMSTRONG, KRATZ, QUINTOS, HANSON & BROOKS, LLP 1725 K STREET, NW SUITE 1000 WASHINGTON, DC 20006			EXAMINER DIAO, M BAYE	
			ART UNIT 2112	PAPER NUMBER

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/10/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

Application No.

10/550,953

Applicant(s)

ARAI ET AL.

Examiner

M'baye Diao

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 28 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 September 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) \*
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08) .  
Paper No(s)/Mail Date 09/28/2005,09/21/2006.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Specification***

2. The disclosure is objected to because of the following informalities:

The word " usable " should read -- used --(page 37, line 16).

The word " a characteristics " should read -- a characteristic --(page 4, line 11;page 35, line 17).

Appropriate correction is required.

### ***Claim Objections***

1. Claims 5, and 13 are objected to because of the following informalities:

The word " a characteristics " should read -- a characteristic --(page 3 and 4).

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

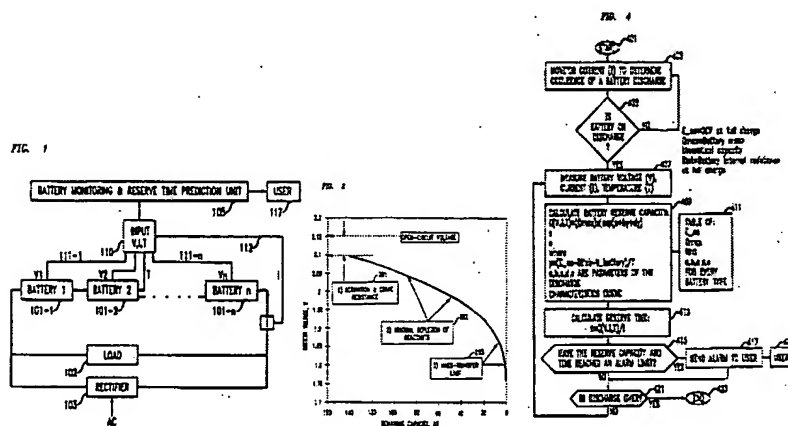
A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. **Claims 1-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Nguyen, US PAT 5,631,540.**

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4. As per claims 1 and 8, Nguyen discloses (abstract; col. 3, lines 7-19) and shows in Figs. 1 and 4, an apparatus and method (applicant's battery condition monitor) of predicting remaining capacity Q (applicant's capacity not to be discharged) which is determined from the difference between the battery full charge open circuit voltage  $E_{oc}$  and the voltage loss due to the internal resistance of the battery and the battery voltage on discharge divided by the battery temperature.



Accordingly claim 1 and 8 are anticipated.

5. As per claims 2-3, 9, and 11, Nguyen discloses (abstract; col. 1, lines 8-12) and shows in Figs. 1 and 2, an apparatus and method (applicant's battery condition monitor) for measuring and predicting (105) the remaining capacity (applicant's capacity not to be discharged) and reserve time of a discharging battery. The remaining capacity is determined from the difference between the battery full charge open circuit voltage  $E_{oc}$  and the voltage loss due to the internal resistance of the battery and the battery voltage on discharge divided by the battery temperature according to the equation (4):

$$\eta = \frac{E_{oc} - IR_{int} - V_{battery}}{T}$$

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He further discloses (col. 3, lines 7-19) the battery monitoring unit (105) connected to a controller-battery interface (110), having a connection (111, 112, and 113), which senses the voltage (112) (applicant's charged capacity detector), current, and temperature respectively.

Accordingly claims 2-3, 9, and 11 are anticipated.

As per claims 4-7, and 12-19, Nguyen discloses (abstract; col. 2, lines 13-49) a highly accurate apparatus and method of predicting remaining capacity (applicant's battery condition monitor) which is determined from the ratio between a maximum theoretical capacity  $Q_{max}$  and its present capacity  $Q$  wherein  $Q$  is determined from the difference between the battery full charge open circuit voltage  $E_{oc}$  and the voltage loss (applicant's voltage drop) due to the internal resistance of the battery and the battery voltage on discharge divided by the battery temperature, thus meeting the limitation of making allowance for a changing value of a characteristic of a changing condition of the battery. Nguyen further discloses (col. 3, lines 23-26) that the stored program controller also includes instructions for utilizing the data input for predicting a remaining charge capacity and reserve time until discharge to a specified end voltage of the batteries.

Nguyen also discloses (col. 2, lines 13-45; col. 3, lines 6-54; col. 4, lines 1-17) that the discharge characteristic of the battery (101) is based on a ratio of the remaining capacity (applicant's first changing value of the open-circuit voltage of a new battery against reduction of the charging condition of the battery caused by discharging) / maximum theoretical capacity (applicant's second changing value of the open-circuit voltage of the battery against reduction of the charging condition of the

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battery caused by discharging) and the remaining the capacity to an end voltage (applicant's second changing value of the open-circuit voltage), at a given battery voltage, is calculated from the difference between the remaining capacity Q at that battery voltage (applicant's first changing value of the open-circuit voltage) and the remaining capacity at that end voltage.

Accordingly claims 4-7, and 12-19 are anticipated.

### ***Conclusion***

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
7. Brilmyer et al., US PAT 4,876,513, discloses a dynamic state of charge indicator for a storage battery characterized by a discharge curve.
8. Pritchard, US PAT 6,087,808, discloses a system and method for accurately determining remaining battery life.
9. Hirsch et al., US PAT 6,137,292, discloses a battery diagnostic method for monitoring the status of a battery in an electrical system.
10. Lee, US PAT 6,157,169, discloses a monitoring technique for accurately determining residual capacity of a battery.
11. Yamanashi, US PAT 6,222,345, discloses a device capable of accurately controlling a battery.
12. Okada et al., US PAT 6,441,587, discloses a method to determine capacity of a battery.

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13. Arai et al., US PAT 6,275,008, discloses a battery capacity detection system with temperature correction.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to M'baye Diao whose telephone number is 571-272-9748. The examiner can normally be reached on M-Th from 8:30 am to 5:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tarifur Chowdhury, can be reached on M-Th from 8:00 am to 5:00 pm at (571)272-9819. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

M'baye Diao  
Examiner  
Art Unit 2112

M.D

  
TARIFUR CHOWDHURY  
SUPERVISORY PATENT EXAMINER